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EXAMINER

BOYD, JONATHAN A

ART UNIT	PAPER NUMBER
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2629

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/599,263	Applicant(s) RAMAN ET AL.	
	Examiner JONATHAN BOYD	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4 and 10-20 is/are rejected.
- 7) ☒ Claim(s) 5-9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 24 September 2010 have been fully considered but they are not persuasive. The Examiner respectfully disagrees with Applicant's assertions on Page 6 of the Remarks that the 35 U.S.C 112 rejections of claims 15,17 and 18 are not proper. No where in the instant application's disclosure , nor claims, can it be found that there are temporary thresholds being set, to properly support Applicant's assertion. Therefore the 35 U.S.C. 112 rejections of claims 15, 17 and 18 are deemed proper.

The Examiner respectfully disagrees with Applicant's assertion on pages 7-10 of the Remarks that Park does not disclose claims 15 or 17, particularly: "means for selecting a dimmed brightness level of the light source in dependence on the gray levels of the image pixels, the means for selecting being adapted to: select the dimmed brightness level in dependence on: (i) a number of occurrences of a gray level corresponding to a brightness level of display pixels above the dimmed brightness level, and (ii) a number of occurrences of a gray level corresponding to a brightness level of display pixels below a predetermined brightness level being a fixed or adjustable level determined in dependence on the dimmed brightness level, and means for adapting the input signal in dependence on the dimmed brightness level". In p[0030]-p[0035] Park teaches counting a number of occurrences of low gray levels and high gray levels within an image and outputting a luminance control signal to alter the luminance of the backlight dependent on the count. P[0035] states that when the high gray levels are

Art Unit: 2629

greater than the low gray levels that the luminance of the backlight is set to an increased value, and in the opposite case when the low gray levels are greater than the high gray levels the luminance of the backlight is set to a value, less than the value of the first case. P[0045] further states how the gray levels are counted by counting the amount of data over a first predetermined gray level and the amount of data below a second predetermined gray level. Thus there is a means for selecting a dimmed brightness level of the backlight by counting a number of occurrences of data over a first predetermined gray level and the amount of data below a second predetermined gray level and adapting a signal to control the luminance of the backlight dependent on the results of the count as shown in Figure 3. Therefore Park does teach both (i) and (ii).

The amendments of claim 15, namely changing from "(i) or (ii)" to "(i) and/or (ii)" do not change the scope of the claim and will still be read as "(i) or (ii)". The statement "and/or" in claim 15 does not force the Examiner to read on both "parts" of the "and/or" statement as stated by Applicant on Page 7 of the Remarks.

Further, the Examiner respectfully disagrees with Applicant's assertions on page 11 and 12 that claims 4, 11, 19 and 20 should be allowable based on the Examiner's reasons for allowance. The Examiner's reasons for allowance are pointing to the particular error function in claim 5, which is the basis for the allowable subject matter. No where in claims 4, 11, 19 or 20 is this function cited.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

Art Unit: 2629

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 15, 17 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In regards to the statement, in claim 15 “selecting the **dimmed brightness level** in dependence on (i) a number of occurrences of a gray level corresponding to a brightness level of display pixels above the **dimmed brightness level**” is in an inappropriate recursive format. Where the dimmed brightness level can not be defined unless one can count the number of occurrences of a gray level and where the number of occurrences of a gray level can not be determined without knowing the dimmed brightness level. The same problem also occurs in statement (ii). Similar problems are present in claims 17 and 18 as well.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 10, 11, 14-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Park (2002/0130830).

In regards to claims 1, 15 and 17, Park teaches a display device comprising an adjustable light source (*See; Fig. 1, element 120*); a display panel with display pixels for modulating light originating from the light source (*See; Fig. 1, element 110 and p[0023]*–

Art Unit: 2629

p[0024]); and processing circuitry coupled to the display panel and the light source (See; Fig. 1, element 200 and p[0026]-p[0028]) ,the processing circuitry having an input for receiving an input signal representing gray levels of pixels of an image to be displayed on the display panel (See; Fig. 1, where inputs RGB connect to data counter 210 and p[0029]) and comprising: means for selecting a dimmed brightness level of the light source in dependence on the gray levels of the image pixels (See; Fig. 3, steps x10 and p[0030]-p[0035] where the number of low and high gray levels are counted for the purpose of having an action on the luminance), the means for selecting being adapted (i) a number of occurrences of a gray level corresponding to a brightness level of display pixels above the dimmed brightness level, and (also read on and/or) (ii) a number of occurrences of a gray level corresponding to a brightness level of display pixels below a predetermined brightness level being a fixed or adjustable level determined in dependence on the dimmed brightness level (See; p[0030]-p[0035] Park teaches counting a number of occurrences of low gray levels and high gray levels within an image and outputting a luminance control signal to alter the luminance of the backlight dependent on the count. P[0035] states that when the high gray levels are greater than the low gray levels that the luminance of the backlight is set to an increased value, and in the opposite case when the low gray levels are greater than the high gray levels the luminance of the backlight is set to a value, less than the value of the first case. P[0045] further states how the gray levels are counted by counting the amount of data over a first predetermined gray level and the amount of data below a second predetermined gray level. Thus there is a means for selecting a dimmed

Art Unit: 2629

brightness level of the backlight by counting a number of occurrences of data over a first predetermined gray level and the amount of data below a second predetermined gray level), and means for adapting the input signal in dependence on the dimmed brightness level (See; Fig. 3, steps x20 and p[0036] for data conversion).

In regards to claim 10, Park teaches the predetermined brightness level being formed by the maximum contrast ratio of the display panel and the dimmed brightness level (See; Fig. 2 and Fig. 3).

In regards to claim 11, Park inherently teaches the input signal comprising color components of the image (See; Fig. 1, RGB input), a component error function being determined for each of the color components, the error function being formed by adding the component error functions (*Inherently taught in the situation of the weighting factor equaling zero, thus the weighted numbers would also equal zero and would further result in the error function equaling zero*).

In regards to claim 14, Park inherently teaches wherein the means for selecting a dimmed brightness level are further adapted to select the dimmed brightness level in dependence on a content of a part of the image (*When confronted with the problem of not distorting the image processing due to external effects, it would have been obvious to process only the useful portion of the image to save processing time*).

In regards to claim 16, Park teaches signal processing circuitry for providing the input signal (*See; Fig. 1, element 900*).

In regards to claim 18, Park teaches wherein the means for selecting being adapted to select the dimmed brightness level in dependence on the number of occurrences of the gray level corresponding to the brightness level of display pixels above the dimmed brightness level and the number of occurrences of the gray level corresponding to the brightness level of display pixels below the predetermined brightness level being the fixed or adjustable level determined in dependence on the dimmed brightness level (*See; Figs. 2, 3 and p[0036], p[0045] where the backlight brightness is adjusted (dimmed) depending on a number of grey levels below and above the predetermined level of 32/64 and 45/64*).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

Art Unit: 2629

2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
8. Claims 4 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park (2002/0130830) in view of Nitta et al (2002/0027551).

In regards to claim 4, Nitta teaches the error function being formed by an addition of the one or more weighted numbers of occurrences (*See Figures 6A and 6B where there are multiple points above and below the desired gray scale that would each have to be multiplied by a weighted number to reach the figure of 6C and thus be added to reach the linear curve*).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Nitta with Park to reduce errors in reaching the desired brightness level in the adjustable light source.

In regards to claims 19 and 20, Nitta teaches substantially minimizes an error function including one or more weighted numbers of occurrences formed by multiplying each of the one or more numbers of occurrences by a weighting factor (*See; Fig. 6C where the grayscale curve is set to the desired grayscale. Where to get from a curve as shown in Figures 6A or 6B that have brightness levels above and below the desired gray level, would require the curve to be multiplied by a number to have it reach the desired grayscale as shown in Fig. 6C*).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Nitta with Park to reduce errors in reaching

Art Unit: 2629

the desired brightness level in the adjustable light source.

9. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park (2002/0130830) in view of Usul et al (EP 0513551) (herein "Usul").

In regards to claim 12, Usul teaches the processing circuitry further comprising means for determining a smoothed dimmed brightness level for an image in dependence on the dimmed brightness level of the image and a previous smoothed dimmed brightness level of a previous image, wherein n is a sequence number of successive images (*See; Abstract where the new brightness level is adjusted in accordance with the previous level*).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Park and Usul's brightness adjustment using previous levels because using the information of previous images is a known technique used for a plurality of reasons, including motion estimation, response time improvement and error calculation.

In regards to claim 13, Usul inherently teaches the smoothing having a faster response time to an increasing dimmed brightness level of subsequent images than to a decreasing dimmed brightness level of subsequent images (*When confronted with the problem of increasing the response time for implementing a new dimmed brightness level, it would have been obvious to reduce the counterbalancing effect of previous*

dimmed brightness levels to increase response time).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Park and Usul's brightness adjustment using previous levels because using the information of previous images is a known technique used for a plurality of reasons, including motion estimation, response time improvement and error calculation.

Allowable Subject Matter

10. Claims 5-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 5 differs from the disclosure of Park and Nitta in that, no error optimization with regards to the upper and/or lower gray levels are performed. When confronted with the problem of displaying the maximum number of gray levels of the input image, Park teaches increasing the number of possible brightness levels as referred to in Fig. 3. Thus it would not have been obvious to one of ordinary skill in the art to calculate the dimmed brightness level according to a function minimizing the number of gray levels that will not be displayed.

Claims 6-9 depend directly or indirectly from claim 5 and thus are allowable for all the same reasons.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN BOYD whose telephone number is (571)270-7503. The examiner can normally be reached on Mon - Fri 6:00 - 4:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on 571-272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. B./
Examiner, Art Unit 2629

/Amr Awad/
Supervisory Patent Examiner, Art Unit 2629